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EXCAVATING SCRAPER BOWL
CONSTRUCTION

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1 Claim. (Cl. 37—129)

This invention relates to new and useful improve-
ments in scrapers, and has particular refer-
ence to a scraper adapted to be towed by a tractor
or the like and to scrape up a load of earth, trans-
port it to any desired point, and dump it. It is
an improvement over the scraper shown in ap-
pliation Serial No. 952, filed January 7, 1948 by
Albert R. Henry, now Patent No. 2,686,672, that
application and this being under common owner-
ship.

The principal object of the present invention is
the provision of a scraper of the class described
having a scraper pan which may be moved
through the ground with less friction than hitherto
possible, and which hence may move a larger
quantity of earth in proportion to the power
expended.

Another object is the provision of a scraper of
the class described wherein the tendency of
earth to pack solidly in the scraper pan is elimi-
nated, thereby providing for easy dumping of
earth therefrom. This is extremely important
when working in clay soils or other sticky soils.

These objects are accomplished by making the
scraper blade, which extends transversely across
the forward edge of the scraper pan, somewhat
shorter than the width of the pan, and by moving
the immediately adjacent portions of the side
walls of the pan inwardly to the ends of the
blade. This provides that the earth, immediately
after it has been cut by the blade, will pass out
of the restricted forward portion of the pan into
the wider rear portion. Thereupon the packed
soil is allowed to break up. This also greatly
reduces the friction of the earth on most of the
side wall surfaces, thereby reducing the force
required to pull the scraper through the earth.

Other objects are simplicity and economy of
construction, efficiency and dependability of op-
eration, and adaptability for use with a wide
variety of earth moving implements of the scoop
or scraper types.

With these objects in view, as well as other
objects which will appear in the course of the
specification, reference will be had to the draw-
ing, wherein:

Fig. 1 is a plan view, partially broken away,
of a scraper embodying the present invention,
shown in the earth transporting position.

Fig. 2 is a fragmentary enlarged longitudinal
section of the scraper as shown in Fig. 1.

Fig. 3 is an enlarged fragmentary plan view of
the scraper.

Fig. 4 is a view similar to Fig. 2, showing the
scraper in the digging position.

Fig. 5 is a front elevation of the scraper pan
shown separate from the remainder of the
scraper.

Fig. 6 is a fragmentary section taken on line
VI—VI of Fig. 2.

Fig. 7 is a fragmentary section taken on line
VII—VII of Fig. 4.

Like reference numerals apply to similar parts
throughout the several views, and the numeral
2 applies to a draft yoke comprising a pair of
parallel spaced apart side arms 4 formed of in-
wardly opening channel iron, a cross-bar 6 ex-
tending between the forward ends of said side
arms, a tongue 8 connected at its rearward end
to cross-bar 6, and a hitch plate 10 fixed to the
forward end of said tongue. Said hitch plate
may be pivotally secured to the drawbar 12 of
a tractor or the like by bolt 14.

A shaft 16 extends transversely between the
rearward ends of side arms 4, being carried rotat-
able in bearing 18 mounted on said side arms.
On each of the outwardly extended ends of said
shaft is rotatably mounted a substantially tri-
ger plate 20. Said plates are disposed in
parallel vertical planes at right angles to shaft
14, and said shaft engages each of said plates at
one corner thereof. A ground engaging wheel 22
is carried for rotation on a stub axle 24 rigidly
fixed to and extending outwardly from each of
plates 20 adjacent a second corner thereof.

A substantially rectangular scraper bowl 26
open at top and bottom and having side walls
28, a curved forward wall 30, and a curved rear
wall 32, is pivotally hung between support plates
29 by means of a pair of trunnion bolts 34. Each
de of said bolts passes through one of bowl side
walls 28 substantially at the center thereof, and
gazes the adjacent support plate 29 substan-
tially at the third corner thereof. Said trunnion
bolts are coaxial, and bowl 26 pivots between side
arms 4. Said bowl is maintained approximately
horizontal at all times by a pair of rollers 38.
Said rollers are carried rotatably on shafts 39
which are mounted in bearings 40 fixed to the
outer surface of bowl forward wall 30. Said shafts
extend transversely outwardly from the bowl, and
rollers 36 are disposed respectively in the chan-
nels forming yoke side arms 4.

A scraper pan 42 having side walls 44 and bot-
tom 46 is swung within bowl 26, the side walls
44 of said pan being pivotally supported on trun-
nion bolts 34. Bearing tubes 48 welded or other-
wise secured to the lower surface of pan bottom
48 are carried pivotally on shaft 18. A blade 50
is fixed to the forward edge of pan bottom 48.
by means of bolts 52, and extends transversely of said pan.

Bar members 54 are welded or otherwise rigidly secured to the outer surfaces of side walls 23 of bowl 26. Said bars converge forwardly of bowl 26, and are pivotally connected at 56 to a piston rod 58. Said piston rod extends forwardly and is operably carried by a hydraulic cylinder 60. Said hydraulic cylinder is pivotally connected at its tail to hitch plate 10 at 62. Said cylinder is of the double acting type, being provided with hydraulic connections 64 and 66 by means of which fluid may be delivered to either end of the cylinder.

The structure so far described is substantially similar to that of application Serial No. 953, and its operation is substantially as follows: Fig. 2 shows the scraper in the dirt carrying position. When hydraulic cylinder 60 is operated to move bowl 26 forwardly with respect to draft yoke 2, the forward movement of trunnion bolts 31 relative to shaft 16 causes support plates 20 to turn rotatively in their own planes in a clockwise direction as viewed in Figs. 2 and 4, and scraper pan 42, being effectively secured to said support plates will be tilted forwardly as shown in Fig. 4, while bowl 26 is maintained upright by the engagement of rollers 36 in side arms 4. Blade 59 will thus be lowered to and below the ground level, as shown in Fig. 4, and forward movement of the scraper will cause pan 42 and bowl 26 to be filled with earth. When the scraper is full, cylinder 60 is operated to return the parts to the position shown in Fig. 2, and the earth may be carried to any point desired. When it is desired to dump the earth, cylinder 60 is operated to move bowl 26 rearwardly with respect to draft yoke 2. This rotates support plates 20 to tilt the scraper pan rearwardly until pan bottom 46 is substantially vertical, whereupon the earth may pass outwardly between the lower edge of bowl rear wall 32 and the rearward edge of pan bottom 46.

Difficulty has been experienced in dumping the earth as described above due to the tendency of the earth to pack very tightly between the side walls 44 of the scraper pan, gravity being insufficient to dislodge it. Also, the friction of the earth against the side walls 46 of the pan, which friction must be overcome to pull the scraper through the earth, places an undue load on the scraper pulling tractor, especially when the scraper is nearly full. The object of this invention is to overcome these difficulties, and this object is accomplished by offsetting inwardly the lower forward corner portions 68 of side walls 44 of scraper pan 42. Portions 68 are parallel with side walls 44, and provide an entry to the pan which is somewhat narrower than the distance between the side walls. Blade 59 extends only between offset wall portions 68. The upper edge of offset wall 68 is connected to side wall 44 by a wall 70. A wall 72 is connected to the rearward edge of wall 68 and is inclined outwardly to side wall 44, and a wall 74 is connected to the rearward edge of wall 70 and is inclined downwardly to pan bottom 46.

As shown in Fig. 4, offset wall portions 68 are only portions of the pan walls to go below the ground level, and since they are parallel with the direction of travel they pass through the ground easily. As the earth cut by blade 56 passes rearwardly from offset wall portions 68, it passes into the wider space between side walls.